

▶▶▶ COMMERCIAL SPACE TRANSPORTATION

The Federal Aviation Administration's (FAA) Office of Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launch activity including launch vehicles and non-federal launch sites authorized by Executive Order 12465 and 49 US Code, Subtitle IX, Chapter 701 (formerly the *Commercial Space Launch Act*). Title 49 and the Executive Order also direct the Department of Transportation (carried out by the FAA) to encourage, facilitate, and promote commercial launches. AST's mission is to license and regulate commercial launch and reentry operations and non-federal launch sites to protect public health and safety, the safety of property, and the national security and foreign policy interests of the United States.

OVERVIEW

Commercial space transportation generally consists of the launch of satellites into orbit for either commercial or government customers by private, non-government entities, called launch services providers. Commercial space transportation also covers suborbital launches, where a payload or vehicle is launched on a trajectory that briefly goes into space but returns to Earth rather than going into orbit, as well as the reentry of objects from space to Earth.

The FAA licenses several expendable vehicles used for commercial orbital launches. The most active include the Pegasus and Taurus, two small vehicles built and operated by Orbital Sciences Corporation (OSC); the Delta IV, a heavy-class vehicle and the Delta II, a medium-class vehicle, both built by United Launch Alliance (ULA), a joint venture between Boeing and Lockheed Martin, and marketed by Boeing Launch Services (BLS); the Zenit-3SL, a heavy-class vehicle built by the Ukrainian company KB Yuzhnoye for the multinational Sea Launch venture; the Atlas V, a heavy-class vehicle built by ULA and marketed by Lockheed Martin Commercial Launch Services (LMCLS), and the Falcon 1, a small launch vehicle built and operated by SpaceX. Commercial vehicles under development include the heavy-class Falcon 9 vehicle by SpaceX and the medium-class Taurus II by OSC. From 1989 through the end of 2009, DOT/FAA has licensed 200 orbital and suborbital commercial launches.

Experimental Permits, for suborbital reusable vehicle development and test flights, were first granted by FAA in 2006 to Blue Origin and Armadillo Aerospace. Some permits have been granted for vehicles participating in the Lunar Lander Challenge, a competition to demonstrate technologies potentially applicable to both future lunar spacecraft and commercial suborbital vehicles, with \$2 million in prizes offered by NASA's Centennial Challenges program.

Six commercial spaceports, located in Alaska, California (Vandenberg Air Force Base and Mojave Air and Space Port), New Mexico, Oklahoma, and Virginia, currently have FAA launch site operator licenses. Several other commercial spaceports around the United States are under development.

REVIEW OF 2009

There were five FAA-licensed launches, all orbital, in 2009, down from 11 in 2008. BLS performed two launches, one Delta II launch of the WorldView 2 earth observation satellite, and a Delta IV launch of a meteorological satellite. Sea Launch conducted one Zenit-3SL launch of a commercial communications

satellite. There was one Falcon 1 launch which orbited a Malaysian earth observation satellite. LMCLS performed one Atlas V launch of a commercial communications satellite. There were no suborbital permit flights during 2009.

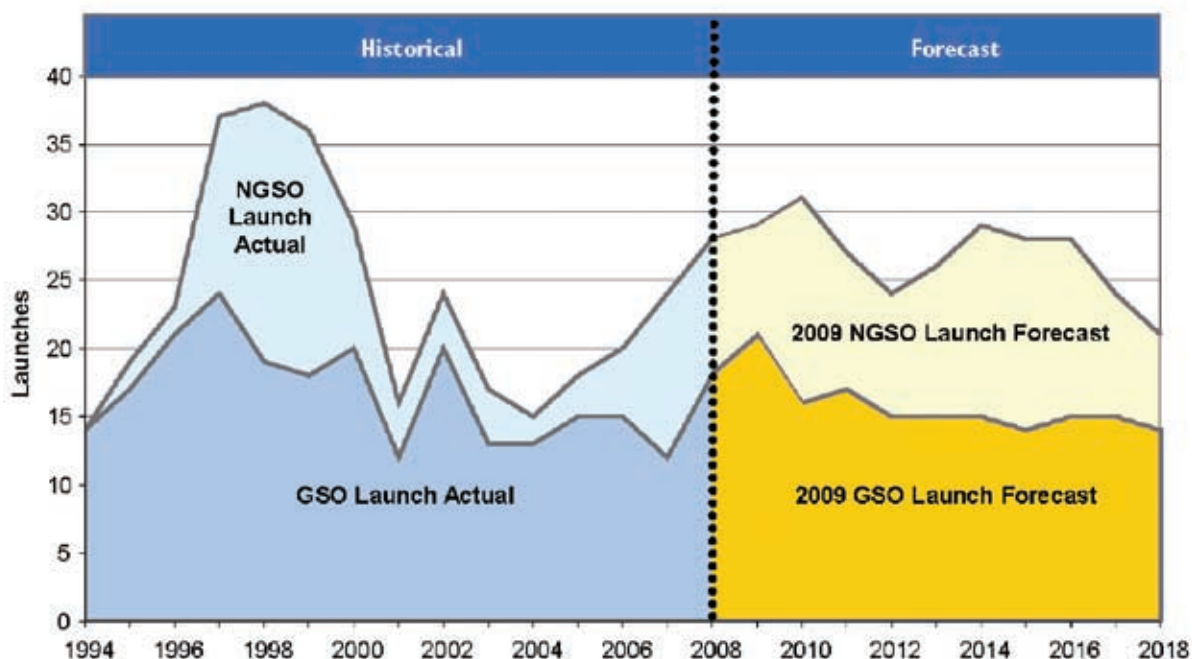
FAA Licensed and Permitted Launches, 2008-2010			
	2008	2009	2010 Forecast
Licensed Launches	11	5	4-7
Permitted Launches	5	0	2-4

Worldwide there were 24 orbital commercial launches in 2009, compared to 28 in 2008. In addition to the five FAA-licensed launches, Europe performed five commercial launches of its Ariane 5, Russia conducted ten launches of various vehicles, and Land Launch, a joint venture of Sea Launch and Space International Services, performed three launches of the Zenit-3SLB. There were 78 total worldwide commercial, civil, and military launches in 2009, with commercial launches representing about 30 percent of the total. For more details, see the Year in Review report available online at:

http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/year_review/.

GLOBAL FORECAST

In May 2009, the FAA and the Commercial Space Transportation Advisory Committee (COMSTAC) published their annual global forecast for commercial launch demand, the 2009 Commercial Space Transportation Forecasts. The report forecasts an average of 26.7 commercial orbital launches per year of geosynchronous orbit (GSO) and non-geosynchronous orbit (NGSO) payloads through 2018. That annual average includes 15.7 launches of medium-to-heavy vehicles to deploy GSO satellites, 8.3 launches of medium-to-heavy vehicles to NGSO, and 2.7 launches to NGSO by small vehicles.



Commercial GSO launches are used for communications satellites with masses ranging from 2,000 to over 6,000 kilograms; satellite masses have tended to grow over time although there is still interest in smaller satellites. Demand for commercial NGSO launches spans a number of markets, including commercial remote sensing, science and technology demonstration missions (often for nations without an indigenous launch capability), and the replenishment and replacement of low Earth orbit communications satellite systems first launched in the late 1990s.

The GSO and NGSO forecasts are not a prediction of what will actually be launched but instead represent the expected demand for launch services, based on a variety of inputs. The complete forecast report is available at: http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/forecasts/.

inadequate and result in even more congestion and delays, it is likely that the forecasts of both demand and workload would not be achieved. The Department of Transportation and the FAA are examining a number of options to manage congestion, but the specific measures to be implemented and therefore their impact are unknown at this time.

There are concerns that aviation's impact on the environment could potentially restrict the ability of the aviation sector to grow to meet national economic and mobility needs. Airport expansion or new construction is often a contentious issue because of noise, air quality, and water quality concerns. Concerns about the climate impacts of aviation emissions are also growing. Although aviation currently accounts for 2 to 3 percent of climate change impacts, greenhouse emissions from the sector are expected to grow unless aggressively mitigated with new technology, renewable fuels, operational improvements and market measures. Market measures intended to control emissions, e.g., various emissions trading systems and charges being discussed, would add significant costs to the aviation sector that could effectively reduce available funds for needed investments in new technology. Energy concerns are also rising, driven by spikes in fuel prices, supply and security issues, and the concerns about fossil fuel contributions to global climate change. Lack of progress on improving the environmental and energy outlook for the future fleet can drive more restrictions via standards or operating limitations on the fleet in service, which in turn can depress growth. By contrast, breakthroughs in quieter, cleaner aircraft technologies and renewable fuels could reduce environmental and energy constraints on the forecast.